

objects, advantages, and features of the present invention nor should any limitation on the scope of the invention be implied therefrom. This Summary is provided in accordance with the mandate of 37 C.F.R. 1.73 and M.P.E.P. 608.01(d) merely to apprise the public, and more especially those interested in the particular art to which the invention relates, of the nature of the invention in order to be of assistance in aiding ready understanding of the patent in future searches. Objects, features and advantages of the present invention will become apparent upon consideration of the following explanation and the accompanying drawings, in which like reference designations represent like features throughout the drawings.

(7) BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In accordance with 37 C.F.R. 1.84(u), in order to prevent confusion with drawings of the Appendix hereto, the drawings of this application use double capital letter suffices.

[0016] FIGURE 1AA is a schematic illustration of the present invention.

[0017] FIGURE 1BB is a schematic illustration of an alternative embodiment of the present invention as shown in FIGURE 1AA.

[0018] FIGURE 2AA is a simplified, schematic block diagram of the present invention as shown in FIGURES 1AA and 1BB.

[0019] FIGURES ~~3AA and 3BB~~ <sup>3AA Cross sectional and 3BB, 3CC</sup> are sequential illustrations of the retraction-extraction steps of use of the present invention as shown in FIGURE 1AA.

[0020] FIGURE 4AA is an exemplary printhead electrode in accordance with the present invention as shown in FIGURE 2AA.

FIGURE 1AA, size is optimized; in FIGURE 1BB, more amenable to such plug-in memory devices, the specific implementation is also more concerned with providing a larger viewing screen at the cost to portability.

[0051] In operation, each document page is sequentially printed from memory 109 through a high resolution electrode array printhead 113. A variety of specific electrodes are fully described in the common assignee's U.S. Pat. Appl. Ser. No. 09/981,131 filed by common inventor Vincent (docket no. 10005743); a description is included hereinafter with respect to FIGURE 4AA.

[0052] The viewing screen 105 is bias mounted, e.g., on a spring-loaded (represented by the double-headed arrows) cylinder 106, and pulled out of the spine 103 and retracted into the spine through a slot 115 in a manner as demonstrated in sequence by FIGURES 3AA <sup>3CC</sup> ~~3BB~~. The microprocessor-based controller 111 can be pre-programmed for a simple download and sequential page turning operation, or an optional user control panel 117 can be provided on the spine 103, allowing user versatility. For example as demonstrated by FIGURES ~~3AA~~ <sup>3BB</sup> and ~~3BB~~ <sup>3CC</sup>, a first page of data from the Wall Street Journal newspaper is downloaded from the memory 109, transferred in a known manner data buffering operation to the printhead 113, and written as a current page while the screen 105 is being extracted from the spine 103, i.e., writing the current page during the position shift of the screen 105 from FIGURE ~~3AA~~ <sup>3BB</sup> to FIGURE ~~3BB~~ <sup>3CC</sup>. Cache memory (not shown) and associated data storage and buffering techniques can be provided for the controller 111.

[0053] Referring also to FIGURE 3AA, screen support rollers 301, 302, 303 can be

FIGURE 1AA, size is optimized; in FIGURE 1BB, more amenable to such plug-in memory devices, the specific implementation is also more concerned with providing a larger viewing screen at the cost to portability.

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[0052] The viewing screen 105 is bias mounted, e.g., on a spring-loaded (represented by the double-headed arrows) cylinder 106, and pulled out of the spine 103 and retracted into the spine through a slot 115 in a manner as demonstrated in sequence by FIGURES 3AA and 3BB. The microprocessor-based controller 111 can be pre-programmed for a simple download and sequential page turning operation, or an optional user control panel 117 can be provided on the spine 103, allowing user versatility. For example as demonstrated by FIGURES 3AA and 3BB, a first page of data from the Wall Street Journal newspaper is downloaded from the memory 109, transferred in a known manner data buffering operation to the printhead 113, and written as a current page while the screen 105 is being extracted from the spine 103, i.e., writing the current page during the position shift of the screen 105 from FIGURE 3AA to FIGURE 3BB. Cache memory (not shown) and associated data storage and buffering techniques can be provided for the controller 111.

[0053] Referring also to FIGURE 3AA, screen support rollers 301, 302, 303 can be

amenable to being carried in a briefcase, but thereby providing a much larger viewing area, e.g., comparable to a writing tablet size, hard copy magazine page, or the like.

[0045] Looking to **FIGURE 2AA**, the e-book 100 of the present invention includes a rewritable screen 105, an electrode array printing device 113, a media translation sensor 118, a reversible, biased, sheet payout device 106, and associated circuitry 107, 109, 111, 119, 125 to download, store, sequence, and erasably print on the screen text and image data. The e-book 100 has, preferably, a single, rewritable, viewing screen 105, using electronic colorant imaging technology. While the screen 105 could have a fixed geometry and orientation as known in the electronic book state of the art, as illustrated and later described with respect to FIGURES 1AA, 2AA, 3AA-3CC, and 5AA the preferred embodiment of the present invention includes a screen 105 that is retractable. In a very compact implementation, the e-book 500 is reduced to a pen-sized appliance 501 as illustrated in **FIGURE 5AA** having a retractable screen 503. **FIGURE 6AA** demonstrates an insertable and removable hard-card screen 603. Because of the nature of the screen 105 writing and erasing technology employed, it is an advantage of the present invention that only a single screen 105 is required.

[0046] The image and text content on the screen 105 is produced using an electronic colorant. Two commercially available technologies adaptable to implementations of the present invention are (1) the microcapsule electronic ink technology available from E-Ink Corporation and described by Jacobson, supra, incorporated herein by reference; and (2) the Xerox<sup>™</sup> Gyricon<sup>™</sup> microsphere technology available from Xerox Corporation as shown in U.S. Pat. No. 5,604,027 (Sheridon),